Food web structure of a nursery estuary and the key role of mysids

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Sixteen years of long term monthly density field data at the Guadalquivir estuary (SW Spain), combined with specific stomach content/stable isotope/fatty acids analysis of main estuarine community species shows a food web structure where mysids play a key role transferring energy from basal primary and detritivorous production up to fish juveniles and crustacean decapods nursering in the estuary. Mysids *Mesopodopsis slabberi*, *Neomysis integer* and *Rhopalophthalmus tartessicus* makes up 46% of total estuary macrofauna biomass and present high P/B rates (38.2, 10.3 and 10.7, respectively). Other main species are fishes *Pomatochistus* spp. (21%), young stages of *Engraulis encrasicholus* (8%) and *Dicentrarchus* spp. (3%) and crustaceans *Palaemon longirostris* (5%) and *Crangon crangon* (5%). SI data confirm stomach content results: the relevance of *M. slabberi* as main prey for most abundant components of the estuarine community. In winter most resident species show an alternance on mysid prey increasing consumption of resident estuarine mysid *N. integer*). FA multivariate CAP analysis separates *M. slabberi* and *R. tartessicus* mainly by FATM 14:0 and 16:1n7, and similar correlation with other FA in the CAP 1 axis suggest significant predation of *R. tartessicus* on *M. salabberi*. *M. slabberi* FA signatures point to microbial derived material (BAME, 18:1n7), diatoms (PU16) and marine type phytoplankton consumption (22:6n3, w3/w6). Carnivory markers (18:1n9 and DHA/EPA) correlated with CAP 1 and were associated to N. integer, indicating the higher trophic position of this mysid species but also a signal of terrestrial material, more linked to the lower salinity point. This is an interesting energy turnover system in an estuary where Chla is roughly 1% of total organic matter. Seasonal results of trophic markers confirm a bidirectional trophic connectivity between estuary and sea.